2003 Annual Tuberculosis Surveillance Report

Virginia Department of Health
Office of Epidemiology
Division of Tuberculosis Control

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

DETECT. TREAT. COMPLETE.
DTC
DIVISION OF TUBERCULOSIS CONTROL

July 2004

Suggested Citation: Virginia Department of Health, Division of Tuberculosis Control, 2003 Annual Tuberculosis Surveillance Report, June 2004.

Office of Epidemiology ..... John S. Marr, MD
Acting Director

Division of Tuberculosis Control .....Margaret Tipple, MD
Director

Surveillance and Epidemiology ..... Wendy J. Heirendt, MPA
Coordinator
Suzanne J. Keller, MA
Epidemiologist
Timothy J. Epps
TB Program Specialist
William J. White
TB Program Specialist

Clinical and Case Management Consultation .....Jane Moore, RN, MHSA
TB Nurse Consultant

Health Education ..... Vipra Ghimire, MPH, CHES
Coordinator, TB Webmaster

Database Administrator……Dave Phillips

Newcomer Health Program .....Anna Davis, RN
Coordinator
Julie Coggsdale
Program Assistant

Administration ..... Paulette Tyler
Business Manager
Donna Asby-Green
TB Registrar
Kimberly Hammond
Fiscal Technician

For more information contact:

Division of Tuberculosis Control
James Madison Building, First Floor
109 Governor Street
Richmond, Virginia 23219

Telephone: 804/864-7906
Fax: 804/371-0248
Internet: http://www.vdh.virginia.gov/epi/tb

Author

Suzanne J. Keller

Reviewers:

Margaret Tipple, Wendy Heirendt, Jane Moore, Vipra Ghimire, Timothy Epps, William White

Acknowledgement

The Division of Tuberculosis Control would like to acknowledge the contributions of DTC Surveillance staff and Central Office staff who contributed to this report. In addition, we extend special appreciation to the district public health nurses and outreach workers who provide the information and data that you will find summarized here. Thank you.

Contents

Epidemiology of Tuberculosis: 2003

Introduction

TB disease is a reportable condition as defined in the *Regulations for Disease Reporting and Control.* In addition, TB infection in children under age 4 is also a reportable condition. The Division of Tuberculosis Control (DTC) conducts surveillance for TB and TB infection among children. It collects, analyzes, and disseminates data as an integral part of TB control. This narrative describes the epidemiology of tuberculosis (TB) in Virginia for 2003. Following this section are tables presenting five year trends in confirmed TB cases. These tables include summary statistics for the state and the health regions.

A total of 332 cases were reported in 2003 as compared to 315 in 2002 for a 4.5% increase. In the United States, cases of reported TB continue to decline, however the Centers for Disease Control and Prevention (CDC) notes a slowing of the decline in 2003. In 2003, 14,871 cases of TB were reported for a case rate of 5.1 per hundred thousand (Table 1). For 2003, Virginia's case rate of 4.5 per hundred thousand ranks it 20th among the states.[1]

Several shifts in key characteristics were noted from 2002 to 2003. As a whole, the cases were younger with an average age of 43 as compared to 45.5 in 2002. Northern region continues to report the most cases, however in 2003 it experienced an 11% decline compared to 2002. Moreover, while Northern region reports the bulk of foreign-born cases, in 2003 with the exception of the Southwest Region, each of the other regions reported an increase of TB among foreign-born persons. Summary demographic data for the state and the health regions can be found in Tables 3-8.

Demographic Characteristics

In 2003, 40% of TB cases were female and 60% were male. The distribution of TB cases by race/ethnicity remained virtually unchanged with 31.6% of cases reported among Asian/Pacific Islanders, 30.4% reported among non-Hispanic Blacks, 19% reported among Hispanics and 19% reported among non-Hispanic Whites. As compared to 2002, Asian/Pacific Islanders and non-Hispanic Blacks experienced an increase and Hispanics and non-Hispanic Whites experienced a small decrease (Table 2).

Nineteen pediatric cases (aged 0 to 14) occurred in 2003 as compared to 16 cases in 2002. Among the 15-24 year old age group, 47 cases were reported for an increase of 30% over 2002. One hundred fifteen cases were reported among the 25-44 year old age group, 89 cases among the 45-64 year old, and 62 cases among people over the age of 64. The distribution of TB cases by age shifted slightly from 2002 with more cases reported among younger persons and slightly fewer cases reported among persons over 64.

The substantial increase in TB cases among the 15-24 age group is of potential public health interest due to the likelihood that this group is enrolled in secondary school or college. Twenty-one or 45% of these cases were students with cases reported from the Northern, Central, and Northwest regions.

In 2003, 25 states including Virginia, reported 50% or more of their cases among foreign-born persons. Two hundred seven or 62.3% of the Virginia's TB cases were reported among foreign-born persons representing 48 countries of origin with 20 primary languages other than English. Due to the increasing proportion of TB cases among foreign-born persons and historic disparities among US-born persons, marginal shifts in the burden of TB can be masked by the traditional race/ethnicity description of TB cases.

In Tables 9-14, race/ethnicity is further categorized by place of birth, either US-born or foreign-born. Regional variation is quite striking: In Northern region for example, 27 cases among non-Hispanic Blacks are foreign-born, compared to 3 cases among US-born non-Hispanic Blacks. In Central and Eastern regions, the reverse is seen,

[1] Centers for Disease Control and Prevention. Trends in Tuberculosis—United States, 1998-2003. MMWR 2004;53:209-214.

with 34 cases reported among US-born non-Hispanic Blacks in Central compared to 3 among foreign-born non-Hispanic Blacks. Likewise in Eastern, 27 cases were reported among US-born non-Hispanic Blacks and none reported among foreign-born non-Hispanic Blacks.

Geographic Distribution

For the first time in five years, the Northern region reported a decline in TB cases, from 177 in 2002 to 157 in 2003 for an 11% decrease. Central region reported 65 cases in 2003 as compared to 45 in 2002 for a 44% increase. Eastern region reported 59 cases as compared to 53 in 2002 for an 11% increase. Northwest region reported 29 cases as compared to 15 in 2002 for a 93% increase. Southwest Region reported 22 cases as compared to 25 in 2002 for a 12% decrease. The most interesting dynamic seen in the data in 2003 as compared to 2002 is the increase of foreign-born cases in the Central, Eastern and Northwest regions
(Tables 4-8).

Selected Risk Factors

Several risk factors are associated with TB including occupational risk, congregate living, co-infection with HIV, co-morbidity with diabetes, substance use and being born in a country of high TB prevalence. These factors can be seen for the state and by region in Tables 15-20. In 2003, eight health care and three migrant workers were reported with TB. Among the 24 (7.2%) long-term care cases, 21 were nursing home residents compared to 14 nursing home residents in 2002. Six cases (1.8%) were reported among prison or jail inmates and 12 (3.6%) cases among homeless persons. Co-infection with HIV was found in 21 cases (6.3%) compared to 12 reported in 2002. Twenty-two (6.6%) cases were reported with diabetes in 2003 and 33 (9.9%) cases reported excessive alcohol use. Twelve (3.6%) additional cases reported injecting drug use or non-injecting drug use.

Drug Resistance

Of the 250 cases of TB that had both a positive culture and drug susceptibility testing performed, drug resistance was found in 34 (13.6%) cases. A case could be resistant to more than one drug and in the following description, drug specific resistance is not mutually exclusive. Among these cases, 24 (9%) were resistant to INH (isoniazid), 19 (7.3%) were resistant to SM (streptomycin), 2 (<1%) were resistant to PZA (pyrazinamide), 1 (<1%) was resistant to EMB (ethambutol) and 3 (1.1%) were resistant to RIF (rifampin). Among these cases, two (<1%) were resistant to both INH and RIF (Table 21).

Mortality

In 2003, 17 (5.1%) TB cases died during treatment and 4 (1.3%) cases were diagnosed at death or post-mortem (Table 22). Late entry into treatment, other underlying medical conditions, and other causes of death may contribute to these untimely deaths.

Treatment Outcomes

For 2002, the year with the most complete data available, 91% of the drug-susceptible cases completed therapy within 12 months. Patients who died at diagnosis or during treatment, and patients who had drug resistance rifampin are not included in the completion of therapy calculation (Figure 1).

Contact Investigations

Contacts were identified on 94% of the newly reported AFB smear positive cases. Of those, 94% were evaluated for infection and disease and 68% completed therapy for TB infection. (Figures 2-4).

TB Infection Among Children

Latent TB infection in children less than 4 years old, as indicated by a Mantoux skin test reaction $\geq$10 mm, is a reportable condition in Virginia. Pediatric TB disease and infection in the very young are a concern as they represent recent infection. In 2002, 46 children were reported with TB infection. In 2003, 14 children were reported.

Table 1. Number and Rate of Tuberculosis Cases: Virginia and United States, 1994-2003

	Virginia		United States	
Year	No.	Rate	No.	Rate
1994	372	5.8	24,361	9.4
1995	350	5.5	22,860	8.7
1996	349	5.3	21,337	8.0
1997	349	5.3	19,851	7.4
1998	339	5.2	18,361	6.8
1999	334	4.9	17,531	6.4
2000	292	4.1	16,377	5.8
2001	306	4.3	15,989	5.6
2002	315	4.5	15,075	5.2
2003	332	4.5	14,871	5.1

US data from : CDC. Reported Tuberculosis in the United States, 2002. Atlanta, GA: US DHHS, CDC, September 2003.
US 2003 data from: CDC. Trends in Tuberculosis--United States, 1998-2003. MMWR 2004;53:Table 2.
See Technical Notes for information about the calculation of rates for Virginia.

Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 1999-2003

	1999			2000			2001			2002			2003		
Region	No.	%	Rate	No.	%	Rate	No.	%	Rate	No.	%	Rate	No.	%	Rate
Total	**334**	**100**	**4.9**	**292**	**100**	**4.1**	**306**	**100**	**4.3**	**315**	**100**	**4.5**	**332**	**100**	**4.5**
Central	54	16.2	4.6	33	11.3	2.8	50	16.3	4.2	45	14.3	3.8	65	19.6	5.2
Eastern	90	26.9	5.4	67	22.9	3.9	50	16.3	2.9	53	16.8	3.1	59	17.8	3.3
Northern	142	42.5	8.3	149	51.0	8.2	174	56.9	9.6	177	56.2	9.8	157	47.3	7.9
Northwest	22	6.6	2.3	22	7.5	2.2	12	56.9	1.2	15	4.8	1.5	29	8.7	2.6
Southwest	26	7.8	2.0	21	7.2	1.6	20	6.5	1.5	25	7.9	1.9	22	6.6	1.7

Table 3. Tuberculosis Cases by Demographics and Location: Virginia, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**334**		**292**		**306**		**315**		**332**	
	No.	%	No.	%	No.	%	No.	%	No	%
Sex										
Female	131	39.2	121	41.4	125	40.8	137	43.5	133	40.1
Male	203	60.8	171	58.6	181	59.2	178	56.5	199	59.9
Race/Ethnicity										
Asian/Pacific Islander	71	21.3	94	32.2	85	27.8	94	29.8	105	31.6
Black, Not Hispanic	128	38.3	96	32.9	101	33.0	86	27.3	101	30.4
Hispanic	41	12.3	46	15.8	70	22.9	69	21.9	63	19.0
White, Not Hispanic	94	28.1	56	19.2	50	16.3	66	21.0	63	19.0
Age										
0-14	13	3.9	13	4.5	11	3.6	16	5.1	19	5.7
15-24	40	12.0	31	16.8	37	12.1	36	11.4	47	14.2
25-44	114	34.1	108	37.0	128	41.8	114	36.2	115	34.6
45-64	79	23.7	91	31.2	75	24.5	83	26.3	89	26.8
>64	88	26.3	49	16.8	55	18.0	66	21.0	62	18.7
Place of Birth										
Foreign-born	158	47.3	187	64.0	193	63.1	189	60.0	207	62.3
US-born	176	52.7	105	36.0	113	36.9	126	40.0	125	37.7
Health Region										
Central	54	16.2	33	11.3	50	16.3	45	14.3	65	19.6
Eastern	90	26.9	67	22.9	50	16.3	53	16.8	59	17.8
Northern	142	42.8	149	51.0	174	56.9	177	56.2	157	47.3
Northwest	22	6.3	22	7.5	12	3.9	15	4.8	29	8.7
Southwest	26	7.8	21	7.2	20	6.5	25	7.9	22	6.6

Table 4. Tuberculosis Cases by Demographics and Region: Central, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**54**		**33**		**50**		**45**		**65**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	20	37.0	8	24.2	17	34.0	24	53.3	19	29.2
Male	34	63.0	25	75.8	33	66.0	21	46.7	46	70.8
Race/Ethnicity										
Asian/Pacific Islander	8	14.8	8	24.2	7	14.0	7	15.9	11	16.9
Black, Not Hispanic	33	61.1	19	55.9	28	56.0	25	56.8	37	56.9
Hispanic	1	1.9	0	0.0	5	9.4	3	6.8	9	13.8
White, Not Hispanic	12	22.2	6	17.6	10	20.0	10	22.2	8	12.3
Age										
0-14	2	3.7	1	3.0	3	6.0	1	2.2	1	1.5
15-24	3	4.4	0	0.0	2	4.0	3	6.7	6	9.2
25-44	12	22.2	16	48.5	18	36.0	9	20.0	21	32.3
45-64	19	35.2	10	30.3	16	32.0	21	46.7	28	43.1
>64	18	41.9	6	18.2	11	22.0	11	24.4	9	13.8
Place of Birth										
Foreign-born	12	22.2	11	33.3	18	36.0	12	26.7	22	33.8
US-born	42	77.8	22	66.7	32	64.0	33	73.3	43	66.2

Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**90**		**67**		**50**		**53**		**59**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	37	41.1	28	41.8	19	38.0	22	41.5	15	25.4
Male	53	58.9	39	58.2	31	62.0	31	58.5	44	74.6
Race/Ethnicity										
Asian/Pacific Islander	12	13.3	20	29.9	5	10.0	10	18.9	17	28.8
Black, Not Hispanic	56	62.2	31	46.3	34	68.0	28	52.8	27	45.8
Hispanic	1	1.1	5	7.5	5	8.8	4	7.5	4	6.8
White, Not Hispanic	21	23.3	11	16.4	6	12.0	11	20.8	11	18.6
Age										
0-14	5	5.6	3	4.5	0	0.0	0	0.0	0	0.0
15-24	9	9.2	6	13.0	4	8.0	3	5.7	4	6.8
25-44	20	22.2	21	31.3	14	28.0	11	20.8	16	27.1
45-64	29	32.2	24	35.8	17	34.0	24	45.3	15	25.4
>64	27	37.0	13	19.4	15	30.0	15	28.3	24	40.7
Place of Birth										
Foreign-born	19	21.1	24	35.8	11	22.0	15	28.3	22	37.3
US-born	71	78.9	43	64.2	39	78.0	38	71.7	37	62.7

Table 6. Tuberculosis Cases by Demographics and Region: Northern, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**142**		**149**		**174**		**177**		**157**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	61	43.0	63	42.3	80	46.0	77	43.5	86	54.8
Male	81	57.0	86	57.7	94	54.0	100	56.5	71	45.2
Race/Ethnicity										
Asian/Pacific Islander	50	35.2	61	40.9	71	40.8	73	41.2	72	45.9
Black, Not Hispanic	34	23.9	40	26.8	32	18.4	26	14.7	30	19.1
Hispanic	31	21.8	34	22.8	55	32.2	59	33.3	35	22.3
White, Not Hispanic	27	19.0	14	9.4	16	9.2	19	10.7	20	12.7
Age										
0-14	4	2.8	7	4.7	8	4.6	14	7.9	11	7.0
15-24	24	17.8	22	25.9	29	16.7	28	15.8	27	17.2
25-44	71	50.0	64	43.0	86	49.4	84	47.5	68	43.3
45-64	23	16.2	43	28.9	31	17.8	25	14.1	32	20.4
>64	20	11.8	13	8.7	20	11.5	26	14.7	19	12.1
Place of Birth										
Foreign-born	117	82.4	136	91.3	155	89.1	154	87.0	143	91.1
US-born	25	17.6	13	8.7	19	10.9	23	13.0	14	8.9

Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**22**		**22**		**12**		**15**		**29**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	7	31.8	11	50.0	5	41.7	5	33.3	9	31.0
Male	15	68.2	11	50.0	7	58.3	10	66.7	20	69.0
Race/Ethnicity										
Asian/Pacific Islander	0	0.0	3	13.6	1	8.3	2	13.3	3	10.3
Black, Not Hispanic	4	18.2	2	9.1	3	25.0	0	0.0	3	10.3
Hispanic	6	27.3	6	27.3	2	10.5	3	20.0	14	48.3
White, Not Hispanic	12	54.5	11	50.0	6	50.0	10	66.7	9	31.0
Age										
0-14	1	4.5	2	9.1	0	0.0	0	0.0	3	10.3
15-24	0	0.0	2	11.1	1	8.3	2	13.3	8	27.6
25-44	7	31.8	4	18.2	5	41.7	3	20.0	6	20.7
45-64	5	22.7	8	36.4	4	33.3	5	33.3	7	24.1
>64	9	52.9	6	27.3	2	16.7	5	33.3	5	17.2
Place of Birth										
Foreign-born	5	22.7	11	50.0	4	33.3	6	40.0	18	62.1
US-born Born	17	77.3	11	50.0	8	66.7	9	60.0	11	37.9

Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**26**		**21**		**20**		**25**		**22**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	6	23.1	11	52.4	4	20.0	9	36.0	4	18.2
Male	20	76.9	10	47.6	16	80.0	16	64.0	18	81.8
Race/Ethnicity										
Asian/Pacific Islander	1	3.8	2	9.5	1	5.0	2	8.0	2	9.1
Black, Not Hispanic	1	3.8	4	19.0	4	20.0	9	36.0	4	18.2
Hispanic	2	7.7	1	4.8	3	14.3	0	0.0	1	4.5
White, Not Hispanic	22	84.6	14	66.7	12	60.0	14	56.0	15	68.2
Age										
0-14	1	3.8	0	0.0	0	0.0	1	4.0	4	18.2
15-24	4	10.3	1	5.6	1	5.0	0	0.0	2	9.1
25-44	4	15.4	3	14.3	5	25.0	7	28.0	4	18.2
45-64	3	11.5	6	28.6	7	35.0	8	32.0	7	31.8
>64	14	58.3	11	52.4	7	35.0	9	36.0	5	22.7
Place of Birth										
Foreign-born	5	19.2	5	23.8	5	25.0	2	8.0	2	9.1
US-born	21	80.8	16	76.2	15	75.0	23	92.0	20	90.9

Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia 1999-2003

	1999		2000		2001		2002		2003	
Race/Ethnicity	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	**176**	**158**	**105**	**187**	**113**	**193**	**126**	**189**	**125**	**207**
Asian/Pacific Islander	0	71	0	94	1	84	0	94	4	100
Black, Not Hispanic	100	28	59	37	69	32	62	24	68	33
Hispanic	3	38	5	41	4	66	9	60	4	58
White, Not Hispanic	73	21	41	15	39	11	55	11	48	15

Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 1999-2003

	1999		2000		2001		2002		2003	
Race/Ethnicity	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	**42**	**12**	**22**	**11**	**32**	**18**	**33**	**12**	**43**	**22**
Asian/Pacific Islander	0	8	0	8	0	7	0	7	0	11
Black, Not Hispanic	33	0	18	1	24	4	24	1	34	3
Hispanic	0	1	0	0	0	5	0	3	1	8
White, Not Hispanic	9	3	4	2	8	2	9	1	8	0

Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 1999-2003

	1999		2000		2001		2002		2003	
Race/Ethnicity	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	**71**	**19**	**43**	**24**	**39**	**11**	**38**	**15**	**37**	**22**
Asian/Pacific Islander	0	12	0	20	0	5	0	10	0	17
Black, Not Hispanic	55	1	30	1	33	1	26	1	27	0
Hispanic	0	1	3	2	0	5	0	4	0	4
White, Not Hispanic	16	5	10	1	6	0	12	0	10	1

Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 1999-2003

	1999		2000		2001		2002		2003	
Race/Ethnicity	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	**25**	**117**	**13**	**136**	**19**	**155**	**23**	**154**	**14**	**143**
Asian/Pacific Islander	0	50	0	61	1	70	0	73	2	70
Black, Not Hispanic	8	26	6	34	7	25	4	22	3	27
Hispanic	0	31	1	33	4	51	9	50	2	33
White, Not Hispanic	17	10	6	8	7	9	10	9	7	13

Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 1999-2003

	1999		2000		2001		2002		2003	
Race/Ethnicity	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	**17**	**5**	**11**	**11**	**8**	**4**	**9**	**6**	**11**	**18**
Asian/Pacific Islander	0	0	0	3	0	1	0	2	1	2
Black, Not Hispanic	4	0	2	0	2	1	0	0	1	2
Hispanic	3	3	1	5	0	2	0	3	1	13
White, Not Hispanic	10	2	8	3	6	0	9	1	8	1

Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 1999-2003

	1999		2000		2001		2002		2003	
Race/Ethnicity	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	**21**	**5**	**16**	**5**	**15**	**5**	**23**	**2**	**20**	**2**
Asian/Pacific Islander	0	2	0	2	0	1	0	2	2	0
Black, Not Hispanic	0	1	3	1	3	1	8	0	3	1
Hispanic	0	1	0	1	0	3	0	0	0	1
White, Not Hispanic	21	1	13	1	12	0	15	0	15	0

Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**334**		**292**		**306**		**315**		**332**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	13	3.9	10	3.4	6	2.0	10	3.2	8	2.4
Migrant	0	0.0	2	0.7	6	2.0	3	1	3	0.9
Corrections	1	0.3	1	0.3	1	0.3	1	0.3	0	0.0
Type of Residence										
Long Term Care	18	5.4	21	7.2	10	3.3	18	5.7	24	7.2
Prison/Jail	9	2.7	6	2.1	3	1.0	4	1.3	6	1.8
Homeless	10	3.0	15	5.1	11	3.6	17	5.4	12	3.6
Co-Morbidity										
HIV	16	4.8	14	4.8	29	9.5	12	3.8	21	6.3
Diabetes	na		1	0.3	16	5.3	13	4.1	22	6.6
Place of Birth										
Foreign-born	159	47.6	190	65.1	194	63.4	189	60.0	208	62.7
Substance Use										
Alcohol	20	6.0	18	6.1	17	5.6	25	7.9	33	9.9
Injecting drug use	2	0.6	1	0.3	2	0.7	2	1.6	8	2.4
Non-injecting drug use	6	1.8	2	0.7	4	1.3	5	1.6	4	1.2

Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**54**		**33**		**50**		**45**		**65**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	3	5.6	1	3.0	2	4.0	1	2.2	3	4.6
Migrant	0	0.0	1	3.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	1	3.0	0	0.0	1	2.2	0	0.0
Type of Residence										
Long Term Care	4	7.4	1	3.0	2	0.0	4	8.9	4	6.2
Prison/Jail	2	3.7	3	9.1	0	0.0	3	6.7	1	1.5
Homeless	3	5.6	3	9.1	2	4.0	3	6.7	6	9.2
Co-Morbidity										
HIV	3	5.6	3	9.1	8	16.0	2	4.4	4	6.2
Diabetes	na		na		2	4.0	5	11.1	3	4.6
Place of Birth										
Foreign-born	12	22.2	11	33.3	18	36.0	12	26.7	22	33.8
Substance Use										
Alcohol	6	11.1	4	12.1	7	14.0	4	8.9	12	18.5
Injecting drug use	0	0.0	1	3.0	1	2.0	1	2.2	3	4.6
Non-injecting drug use	3	5.6	1	3.0	2	4.0	4	8.9	2	3.1

Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**90**		**67**		**50**		**53**		**59**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	3	3.3	1	3.7	2	4.0	1	1.9	1	1.7
Migrant	0	0.0	1	1.5	4	8.0	3	5.7	2	3.4
Corrections	1	1.1	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	2	2.2	5	7.5	2	4.0	2	3.8	3	5.1
Prison/Jail	3	3.3	0	0.0	1	2.0	0	0.0	1	1.7
Homeless	3	3.3	2	3.0	0	0.0	3	5.7	3	5.1
Co-Morbidity										
HIV	3	3.3	5	7.5	5	10.0	3	5.7	3	5.1
Diabetes	na		1	1.5	7	14.0	4	7.5	6	10.2
Place of Birth										
Foreign-born	19	21.1	24	35.8	11	22.0	15	28.3	22	37.3
Substance Use										
Alcohol	8	8.9	4	6.0	2	4.0	8	15.1	7	11.9
Injecting drug use	0	0.0	0	0.0	1	2.0	0	0.0	3	5.1
Non-injecting drug use	3	3.3	1	1.5	1	2.0	1	1.9	0	0.0

Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**142**		**149**		**174**		**177**		**157**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	5	3.5	6	4.0	2	1.1	7	4.0	2	1.3
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	0	0.0	10	6.7	3	1.7	10	5.6	15	9.6
Prison/Jail	2	1.4	3	2.0	1	0.6	1	0.6	3	1.9
Homeless	4	2.8	6	4.0	6	3.4	8	4.5	3	1.9
Co-Morbidity										
HIV	8	5.6	6	4.0	16	9.2	6	3.4	12	7.6
Diabetes	na		na		6	3.4	4	2.3	4	2.5
Place of Birth										
Foreign-born	117	82.4	136	91.3	155	89.1	154	87.0	143	91.1
Substance Use										
Alcohol	2	1.4	5	3.4	6	3.4	5	2.8	5	3.2
Injecting drug use	1	0.7	0	0.0	0	0.0	1	0.6	2	1.3
Non-injecting drug use	0	0.0	0	0.0	0	0.0	1	0.6	2	1.3

Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**22**		**22**		**12**		**15**		**29**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	1	4.5	1	4.5	0	0.0	0	0.0	1	3.4
Migrant	0	0.0	0	0.0	2	16.7	0	0.0	1	3.4
Corrections	0	0.0	0	0.0	1	8.3	0	0.0	0	0.0
Type of Residence										
Long Term Care	5	22.7	2	9.1	0	0.0	1	6.7	2	6.9
Prison/Jail	1	4.5	0	0.0	0	0.0	0	0.0	1	3.4
Homeless	0	0.0	3	13.6	1	8.3	1	6.7	0	0.0
Co-Morbidity										
HIV	1	4.5	0	0.0	0	0.0	2	13.3	1	3.4
Diabetes	na		na		1	8.3	0	0.0	6	20.7
Place of Birth										
Foreign-born	5	22.7	11	50.0	4	33.3	6	40.0	18	62.1
Substance Use										
Alcohol	1	4.5	3	13.6	4	5.0	1	6.7	4	13.8
Injecting drug use	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-injecting drug use	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**26**		**21**		**20**		**25**		**22**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	1	3.8	1	4.8	0	0.0	1	4.0	1	4.5
Migrant	0	0.0	0	0.0	2	10.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	1	5.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	6	23.1	0	0.0	0	0.0	0	0.0	0	0.0
Prison/Jail	1	3.8	0	0.0	1	5.0	0	0.0	0	0.0
Homeless	0	0.0	1	4.8	2	0	0	0.0	0	0.0
Co-Morbidity										
HIV	1	3.8	0	0.0	0	0.0	0	0.0	1	4.5
Diabetes	na		na		1	5.0	0	0.0	3	13.6
Place of Birth										
Foreign-born	5	19.2	5	23.8	5	25.0	2	8.0	2	9.1
Substance Use										
Alcohol	1	3.8	2	9.5	1	5.0	5	20.0	5	22.7
Injecting drug use	1	3.8	0	0.0	0	0.0	0	0.0	0	0.0
Non-injecting drug use	0	0.0	0	0.0	1	5.0	0	0.0	0	0.0

Table 21. Tuberculosis Cases with Drug Resistance: Virginia, 1999-2003

	1999		2000		2001		2002		2003	
Total Cases	**334**		**292**		**306**		**315**		**332**	
Drug Resistance	No.	%	No.	%	No.	%	No.	%	No.	%
Total	**24**	**9.7**	**43**	**18.9**	**34**	**13.7**	**32**	**12.1**	**34**	**13.6**
Any firstline drug	20	8.1	36	15.8	24	9.6	28	10.6	32	12.3
Multidrug*	4	1.6	7	3.1	10	4.0	4	1.5	2	0.8

*Multidrug resistance or MDR is by definition resistance to isoniazid and rifampin.

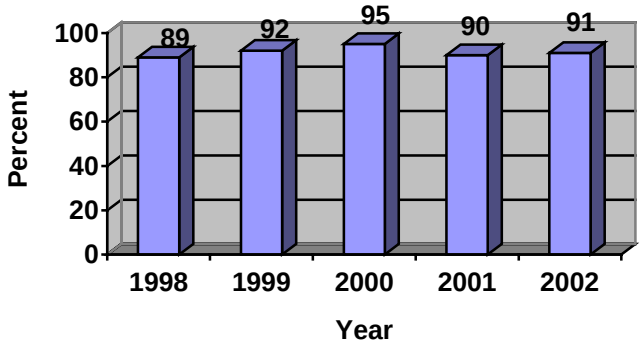
Table 22. Tuberculosis Mortality: Virginia, 1999-2003*

	1999		2000		2001		2002		2003	
Total Cases	**334**		**292**		**306**		**315**		**332**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Deaths	**38**	**11.4**	**24**	**8.2**	**26**	**8.5**	**19**	**6.0**	**21**	**6.3**
Dead at Time Diagnosis	9	2.7	7	2.4	7	2.3	4	1.3	4	1.3
Died During Treatment	29	8.7	17	5.8	19	6.2	15	4.8	17	5.1

*If a person is diagnosed with TB post-mortem or diagnosed with TB at the time of death they are coded as dead at the time of diagnosis. If they died during TB treatment, they are coded as died during treatment. There may be people in either of these categories whose underlying cause of death is not TB.

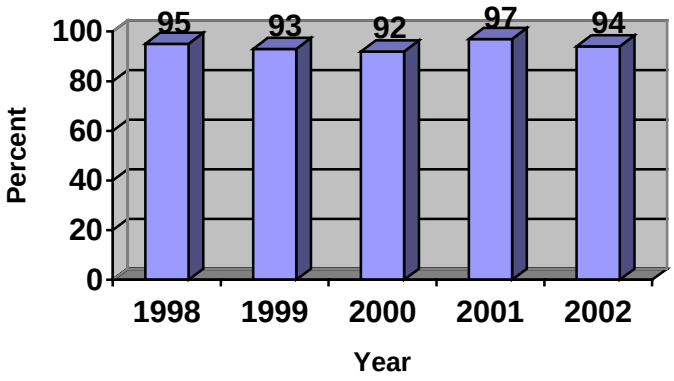
The national program objective for completion of therapy is 90%

Figure 1. Completion of Therapy for Drug Susceptible Tuberculosis Cases: Virginia, 1998-2002



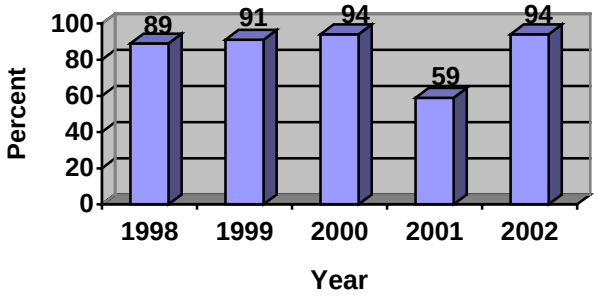
The national program objective for identification of contacts is 90%.

Figure 2. Percent Sputum Smear Positive Cases with Contacts Identified: Virginia, 1998-2002



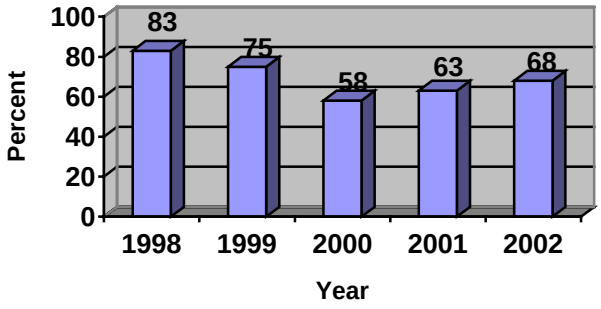
The national program objective for evaluation of contacts is 95%.

Figure 3. Percent Sputum Smear Positive Cases with Contacts Evaluated: Virginia, 1998-2002



The national program objective for completion of therapy for LTBI is 85%.

Figure 4. Percent Contacts by Completion of LTBI Therapy: Virginia, 1998-2002



Technical Notes

Rates per 100,000

In Tables 1 and 2 rates for Virginia were calculated using population estimates for 1994 through 1999 provided by the Virginia Employment Commission. Rates for 2000-2002 were calculated using 2000 Census data released by the United States Bureau of the Census. Rates for 2003 were calculated using population estimates released by the United States Bureau of the Census, April 9, 2004. All rates are calculated per 100,000 persons in the population.

Definitions

Pediatric: In this report "pediatric" refers to persons up to and including the age of 14 years old.

Tuberculosis Case Definition[2]

Cases confirmed as official morbidity in Virginia and included in this report meet the following case definition:

Clinical description
A chronic bacterial infection caused by *Mycobacterium tuberculosis,* characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

Clinical Case Definition
A case that meets the following criteria:

- A positive tuberculin skin test
- Other signs and symptoms compatible with tuberculosis (e.g., an abnormal, unstable [i.e., worsening or improving] chest radiograph, or clinical evidence of current disease)
- Treatment with two or more antituberculosis medications
- Complete diagnostic evaluation

Laboratory criteria for diagnosis

- Isolation of *M. tuberculosis* from a clinical specimen* or
- Demonstration of *M. tuberculosis* from a clinical specimen by nucleic acid test**, or
- Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained.

Case classification
Confirmed: a case that meets the clinical case definition or is laboratory confirmed.

*Use of rapid identification techniques for *M. tuberculosis* (e.g., DNA probes and mucolic acids high-pressure liquid chromatography performed on a culture from a clinical specimen) are acceptable under this criterion.

**Nucleic acid amplification (NAA) tests must be accompanied by culture for mycobacteria species. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert.

[2] CDC. Case Definitions for infectious conditions under public health surveillance. MMWR 1997;46(No. RR-10):40-41.